



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/570,669

03/06/2006

Akihiko Endo

P29121

1242

7055 7590 10/08/2009
GREENBLUM & BERNSTEIN, P.L.C.
1950 ROLAND CLARKE PLACE
RESTON, VA 20191

EXAMINER

SARKAR, ASOK K

ART UNIT

PAPER NUMBER

2891

NOTIFICATION DATE

DELIVERY MODE

10/08/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

gbpatent@gbpatent.com
pto@gbpatent.com

Office Action Summary	Application No. 10/570,669	Applicant(s) ENDO ET AL.	
	Examiner Asok K. Sarkar	Art Unit 2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 July 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 March 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aga, US 6,884,696 in view of Kikuchi, US 5,753,353 and Toshiro, JP 05 - 226620.

Art Unit: 2891

Regarding claim 1, Aga teaches a manufacturing method of an SOI wafer, comprising:

- preparing a supporting wafer 1; and
- ion – implanting hydrogen gas or a noble gas element to an active layer wafer 2 to thereby form an ion – implanted layer 4 in said active layer wafer 2;
- bonding said active layer wafer with a the other surface of said supporting wafer via an insulating film 3 interposed therebetween to thereby form a bonded wafer;
- and then heat treating said bonded wafer to thereby induce cleavage in a portion of said bonded wafer at the site of the ion – implanted layer 4 as an interface to thereby form an SOI layer with said remaining active layer wafer for manufacturing said SOI wafer with reference to Fig. 1 in between columns 5 – 7 under the “Best Mode for Carrying out the Invention”.

Aga fails to teach (1) the supporting wafer comprising boron by in an amount of 9×10^{18} atoms/cm³ or more; and (2) forming an insulating film having a thickness of 0.1 – 0.5 μm on at least a surface opposite to the bonding surface of said supporting wafer prior to said bonding.

Regarding element (1), Kikuchi teaches the supporting wafer comprising boron by in an amount of 9×10^{18} atoms/cm³ or more in column 5, lines 1 – 11 for the benefit of forming an SOI wafer with improved gettering of heavy metals as contaminants in column 1, lines 4 – 6.

Therefore, it would have been obvious to one with ordinary skill in the art at the time of the invention to modify Aga and provide a supporting wafer comprising boron by

Art Unit: 2891

in an amount of 9×10^{18} atoms/cm³ or more for the benefit of forming an SOI wafer with improved gettering of heavy metals as contaminants as taught by Kikuchi in column 1, lines 4 – 6.

Regarding element (2), Toshiro teaches a manufacturing method for an SOI wafer comprising the steps of forming a rear surface oxide insulating film 12 which is 0.3 μ m thick on a surface on at least a surface opposite to the bonding surface of said supporting wafer prior to said bonding with references to Drawings. 1 and 2 in paragraphs 13 – 18 for the benefit of reducing the warpage of the SOI substrate and at the same time prevent mixtures of impurities coming into the SOI layer from the support substrate in paragraphs 5 – 7.

Therefore, it would have been obvious to one with ordinary skill in the art at the time of the invention to modify Aga and form a rear surface oxide insulating film on a surface opposite to the bonding surface of the supporting wafer prior to the bonding for the benefit of reducing the warpage of the SOI substrate and at the same time prevent mixtures of impurities coming into the SOI layer from the support substrate as taught by Toshiro in paragraphs 5 – 7.

Regarding claim 3, Aga teaches a thickness of the SOI layer is less than 0.10 μ m in column 5, line 65 and in column 10, line 18.

Response to Arguments

5. Applicant's arguments filed July 13, 2009 have been fully considered but they are not persuasive.

The Applicant argues (see last paragraph in page 3) that one of ordinary skill would not combine Aga with Kikuchi and to establish a prima facie case of obviousness, there must be some suggestion or reason, either in the documents themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Applicants also allege that no proper combination of Aga with Kikuchi has been made since there is no teaching or suggestion in Aga that would provide one of ordinary skill in the art with a reason to have boron in the wafer disclosed by Aga. These arguments are not at all persuasive. The reasons for combining references are that the motivation for combining can come from any of the primary or the secondary references. In the present invention, the motivations have been already described in the rejection above and the Examiner maintains the rejection for the above mentioned reasons.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

Art Unit: 2891

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Asok K. Sarkar whose telephone number is 571 272 1970. The examiner can normally be reached on Monday - Friday (9 AM- 6 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kiesha L. Bryant can be reached on 571 272 1844. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Asok K. Sarkar/
Primary Examiner, Art Unit 2891
September 30, 2009